

## Work Order 90-6

### 1990 Quarterly Monitoring of the Georgetown Flume

#### I. SCOPE OF WORK

In November 1985, PCB-contaminated sediments were removed from the Georgetown Flume system. PCB-contaminated soils in the catch basin area of the Steam Plant yard were also excavated during the 1985 cleanup. In 1987, to comply with a Department of Ecology order and to ensure that the Flume was not recontaminated with PCBs, City Light established a monitoring program. Since 1987, Raven Systems has collected sediment samples along the Flume on a quarterly basis. This monitoring program will continue until the Flume is closed and filled in. Sample locations, which are described below, are consistent with collection points originally established in 1987.

In 1989, City Light began an additional sampling project designed to determine PCB levels in the Flume's wooden interior lining. Several wood core samples from the Flume's floorboards were collected and analyzed for PCB content. This sampling will continue and be completed in 1990. In addition, the 1990 monitoring program will include sampling of the catch basin area of the Steam Plant yard. No sampling has been conducted in this area since the 1985 cleanup. The location of wood core and soil samples is described in section II below.

Finally, water temperatures at the flume head and at the end of the double pipes will be recorded each quarter. The state of the tide and Flume sediment and water conditions will also be reported.

#### II. SAMPLES

##### Routine PCB Monitoring:

Sediment samples will be collected at 7 monitoring points along the flume as follows:

#1 and	
#2 - Flume Head	2 composites of 2 subsamples
#3 - Head of Double Pipes	1 composite of 2 subsamples
#4 - Above Tidegate	1 composite of 4 subsamples
#5 - Below Tidegate	1 composite of 4 subsamples
#6 - Willow Street	1 composite of 2 subsamples
#7 - Slip 4 Outfall	1 composite of 2 subsamples

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#### Additional 1st Quarter Sample Collection:

During the first quarter only, Raven will collect soil samples from the 1985 cleanup site near the Steam Plant building. In addition, 4 wood core samples will be collected along the flume above the Tidegate; this will complete characterization of the wooden flume sections.

At the 1985 cleanup site, monitoring will consist of 3 composite soil samples of 3 subsamples each. Soil sample collection should be concentrated in the catch basin area since the probability of recontamination is highest in this portion of the Steam Plant yard.

All samples shall be analyzed for PCBs at the MBE laboratory in Portland, Oregon. Analytical results shall be reported as ppm PCB citing specific aroclor mixtures detected. Original lab data describing QA/QC procedures, detection limits plus any other relevant information shall be included with each quarterly report.

### III. SAMPLE METHODOLOGY AND REPORT

#### A. Methodology

1. Collection, storage, processing, and analysis of samples will be according to current United States Environmental Protection Agency (USEPA) standards. PCB analysis will follow Method 8080 (USEPA document SW-846, 1986).
2. Sampling equipment will be decontaminated between each sample. Solvent rinse will be collected.
3. Appropriate protective gear will be used to ensure safety for the sampling crew.
4. After analysis is completed, any remaining sample materials, if they constitute a hazardous material, may be returned to City Light for appropriate disposal.
5. Drawings will be provided on which the location of samples will be marked.
6. Sample chain-of custody procedures will be used when requested.

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B. Report

This report will include:

1. Description of the conditions and date(s) of sample collection.
2. Documentation detailing all steps taken to prepare sampling equipment and containers so as to avoid sample contamination or cross-contamination.
3. Description of containers, procedures, reagents, etc., used for sample collection, preservation, transport, and storage.
4. Statement of field sampling procedures.
5. Sample preservation methods and holding time.
6. Sample chain-of-custody procedures when required.
7. Documentation of methods used for sample processing and analysis including any changes from the test procedures in Method 8080 in method, apparatus, reagents, calibration, quality control, extraction, separation, gas chromatography, or calculations.
8. Laboratory results are to be expressed on a dry-weight basis and by identifying PCB composition or Arochlor species; results also will include a brief description of the sample matrix; e.g., concrete, soil, water, gravel etc.).
9. Documentation of each sampling site.
10. Interpretation of the data along with conclusions and recommendations.

IV. PROJECT SCHEDULE

<u>Deliverable Items</u>	<u>Due Date</u>
Sample collection	Day 0
Draft report	Day 21
Final report to EAD	one week after review of draft by EAD

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V. PROJECT BUDGET

1st Quarter Budget:

Startup: \$ 90.00

Field:

project manager-reconnaissance (3 hours @ \$47/hour)	141.00
project manager (8 hours @ \$47/hour)	376.00

Office and Preparation:

project manager (4 hours @ \$45/hour)	180.00
project assistant (7 hours @ \$35/hour)	245.00
administrative support (2 hours @ \$24/hour)	48.00
WBE graphics preparation (14 hours @ \$40/hour)	560.00
15% WBE carrying cost (15% x \$560.00)	84.00

Other:

MBE PCB analysis (10 sediment samples @ \$70/each)	700.00
(4 wood core samples @ \$70/each)	280.00
15% MBE carrying cost (15% x 980.00)	147.00
chemicals and glassware	29.00
mileage and travel (40 miles @ .25/mile)	10.00

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Subtotal - 1st Quarter Budget \$2,890.00

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2nd Quarter Budget:

Startup: 90.00

Field:

project manager  
(6 hours @ \$47/hour) 282.00

Office and Preparation:

project manager  
(4 hours @ \$45/hour) 180.00  
administrative support  
(1 hour @ \$24/hour) 24.00  
WBE graphics preparation  
(4 hours @ \$40/hour) 160.00  
15% WBE carrying cost  
(15% x \$160.00) 24.00

Other:

MBE PCB analysis  
(7 sediment samples @ \$70/each) 490.00  
15% MBE carrying cost  
(15% x \$490.00) 73.50  
chemicals and glassware 19.00  
mileage and travel  
(30 miles @ .25/mile) 7.50

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Subtotal - 2nd Quarter Budget \$1,350.00

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3rd Quarter Budget:

Startup: \$ 90.00

Field:

project manager  
(6 hours @ \$47/hour) 282.00

Office and Preparation:

project manager  
(4 hours @ \$45/hour) 180.00  
administrative support  
(1 hour @ \$24/hour) 24.00  
WBE graphics preparation  
(4 hours @ \$40/hour) 160.00  
15% WBE carrying cost  
(15% x \$160.00) 24.00

Other:

MBE PCB analysis  
(7 sediment samples @ \$70/each) 490.00  
15% MBE carrying cost  
(15% x \$490.00) 73.50  
chemicals and glassware 19.00  
mileage and travel  
(30 miles @ .25/mile) 7.50

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Subtotal - 3rd Quarter Budget \$1,350.00

SCL 04437

CTY0049445

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4th Quarter Budget:

Startup: \$ 90.00

Field:

project manager  
(8 hours @ \$47/hour) 376.00

Office and Preparation:

project manager  
(6 hours @ \$45/hour) 270.00  
administrative support  
(2 hours @ \$24/hour) 48.00  
WBE graphics preparation  
(4 hours @ \$40/hour) 160.00  
15% WBE carrying cost  
(15% x \$160.00) 24.00

Other:

MBE PCB analysis  
(7 sediment samples @ \$70/each) 490.00  
15% MBE carrying cost  
(15% x \$490.00) 73.50  
chemicals and glassware 19.00  
mileage and travel  
(40 miles @ .25/mile) 10.00

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Subtotal - 4th Quarter Budget \$1,560.50

TOTAL 1990 BUDGET \$7,150.50

SCL 04438

CTY0049446

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## WORK ORDER 89-6

### QUARTERLY MONITORING OF THE GEORGETOWN FLUME

#### I. SCOPE OF WORK

Until the eventual closure and filling in of the Georgetown flume, Raven will conduct quarterly sampling of the flume for PCB content in sediments. Samples are as described below.

#### II. SAMPLES

Samples of flume sediments will include a composite of two subsamples at the flume head, one sample at the head of the double pipes, a composite of four each above and below the tide gate, and a composite of two subsamples taken on either side of the Myrtle St. Bridge. The locations should be near the sample locations taken in Work Order 87-5. In addition, fragments of the wood floorboards of the flume shall be sampled in two locations, including the head of the flume. Samples of the wood walls of the flume are not currently requested although Raven may choose to sample these as well if they find basis for concern.

Temperature measurements of the water in the flume head and at the exit of the double pipe portion of the flume, in addition to ambient air temperature, shall also be recorded.

#### III. SAMPLING METHODOLOGY AND REPORT

##### A. Methodology

1. Collection, storage, processing, and analysis of samples will be according to current USEPA Standards. PCB analysis will follow the Method 8080 (EPA document SW-846, 1982).
2. Sampling equipment will be decontaminated between each sample. Solvent rinse will be collected.
3. Appropriate protective gear will be used to ensure safety for the sampling crew.
4. After all analyses are completed, any remaining sample materials, if they constitute a hazardous material, may be returned to City Light for appropriate disposal.
5. Drawings will be provided on which the location of samples will be marked.
6. Sample chain-of-custody procedures will be used when requested.



## B. Report

This report will include:

1. Description of the conditions and date(s) of sample collection, including times samples are taken and tide level information correlating to the time of sampling.
2. Documentation of preparation of sampling equipment and containers to avoid sample contamination.
3. Description of containers, procedures, reagents, etc., used for sample collection, preservation, transport, and storage.
4. Field sampling procedures.
5. Sample preservation methods and holding time.
6. Sample chain-of-custody procedures when required.
7. Documentation of methods for sampling, processing, and analysis (including any changes from the test procedures in Method 8080 in method, apparatus, reagents, calibration, quality control, extraction, separation, gas chromatography, or calculations).
8. Laboratory results expressed on a dry-weight basis and identifying PCB composition or Arochlor species, including a brief description of the sample material (e.g., concrete, soil, grave, etc.).
9. Documentation of each sampling site.
10. An interpretation of the data along with conclusions and recommendations.

## IV. SCHEDULE

Sample collection	-	Due Date
Draft report to EAD	-	Day 0
Final report to EAD	-	Day 21
		one week after review of draft by EAD

## WORK ORDER 88-12

### "PCB Monitoring of the Georgetown Flume"

#### I. SCOPE OF WORK

In this work order Raven will sample and analyze the sediments in the Georgetown flume, both above and below the tide gate, and downstream from the tunnel. The locations should be near the sample locations taken in Work Order 5.

In determining the sample design, Raven will consider number of samples needed to provide a representative profile of the sediments. Composite sampling should be used where possible, but discrete samples from each composite subsample shall be archived to obviate resampling in the event further, more detailed data on PCB distribution and concentrations is needed.

Temperature measurements of the water in the flume head and at the exit of the double pipe portion of the flume, in addition to ambient air temperature, shall also be recorded.

Please note that the report should contain the times samples are taken and that tide level information correlating to the time of sampling is included (see report section of this work order).

#### II. SAMPLING METHODOLOGY AND REPORT

##### A. Methodology

1. Collection, storage, processing, and analysis of samples will be according to current U. S. Environmental Protection Agency Standards. PCB analysis will follow the Method 8080 (EPA document SW-846, 1982).
2. Sampling equipment will be decontaminated between each sample. Solvent rinse will be collected.
3. Appropriate protective gear will be used to ensure safety for the sampling crew.
4. After all analyses are completed, any remaining sample materials, if they constitute a hazardous material, may be returned to City Light for appropriate disposal.

##### B. Report

This report will include:

1. Description of the conditions, date(s), and times (military) of sample collection.

2. A table matching sample times with tide table data on tide levels.
3. Documentation of preparation of sampling equipment and containers to avoid sample contamination.
4. Description of containers, procedures, reagents, etc., used for sample collection, preservation, transport, and storage.
5. Field sampling procedures.
6. Sample chain-of-study procedures.
7. Documentation of methods for sampling processing and analysis (including any changes from the test procedures in Method 8080 in method, apparatus, reagents, calibration, or quality control, extraction, separation, gas chromatography, or calculations).
8. Laboratory results expressed on a dry-weight basis and identifying PCB composition or Arochlor species, including a brief description of the sample material (e.g., concrete, soil, gravel, etc.).
9. Documentation of each sampling site.
10. An interpretation of the data along with conclusions/ recommendations.

### III. SCHEDULE

		<u>Due Date</u>
Sample Collection	-	Day 0
Draft Report to EAD	-	Day 21
Final Report to EAD	-	One Week after review of draft by EAD

Two copies of a report in draft form will be delivered to EAD. Five copies of a final report will be delivered to EAD.

WORK ORDER #87-5

POST CLEANUP SAMPLING OF GEORGETOWN STEAM PLANT  
INVESTIGATION OF MYRTLE STREET BARN  
AND  
VERIFICATION OF SAMPLES FROM WORK ORDER #87-2

I. SCOPE OF WORK

Various activities are initiated under this work order. A summary of the required samples follows:

	<u>Soil</u>	<u>Sediment</u>
Georgetown Steam Plant	3	4
Myrtle Street Site	2	
Verification Samples, #87-2	5	

Samples from the Georgetown Steam Plant and Myrtle Street site will be analyzed using the S-Cubed instrumentation to screen for any problem areas. These samples will be archived until it is determined that no further analysis is necessary. Five samples from work order #87-2 will be analyzed with the HP gas chromatograph to verify previous results from the S-Cubed gas chromatograph.

GEORGETOWN STEAM PLANT

A cleanup of PCB contaminated sediments and soils at the Georgetown Steam Plant and related environs was completed November 15, 1985. The cleanup encompassed areas in the Steam Plant yard and nearby drainage systems including the steam plant tunnel, open flume, and portion of Boeing's storm sewer. As per an agreement with the Department of Ecology, City Light is committed to periodically resampling the area to assure that no further contamination has occurred.

Raven will conduct the following sampling:

- Flume:
1. One composite of 4 subsamples on each side of the Myrtle Street Bridge.
  2. One composite of 5 subsamples near the tide gate where the flume is exposed.
  3. One composite of 4 subsamples in the pond upstream of the split flume.
  4. One Shelby core behind the wooden sediment barrier at the tunnel entrance.

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May 6, 1987

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|--------------|---|
| Fire Pit     | 1. One composite of 5 in the old catch basin fill near the fence. |
| Drain Course | 2. One composite of 5 midway between the basin area and the road. |
|              | 3. One composite of 5 in the drain course near the road.          |

MYRTLE STREET

A small brick building stands on a vacant lot at 1030 S. Myrtle Street. The lot is jointly owned by City Light and the City's Department of Administrative Services. City Light owns a small triangular portion of the lot which is an easement to the Georgetown Steam Plant flume.

The property was occupied by a metal scrapper until November, 1986. When the scrapper vacated, material was left in the brick building. This material consists of acetylene tanks, rolls of roofing paper, and 12 barrels of an unidentified substance. The barrels are rusty and in various stages of degradation. In addition, an underground tank is present.

Raven will conduct a physical survey of the salvage yard debris in the old building, including the rusty barrel contents and the apparently underground gasoline tank. Samples will be archived where appropriate. In addition, the following samples will be taken in the salvage yard:

1. One composite of 5 including the oil spot near the old building.
2. One composite of 5 at the point midway between gate and corner boundaries near the boundary line.

VERIFICATION OF SAMPLES FROM WORK ORDER #87-2

Work order #87-2, PCB Testing at Northgate, North Beach, and Meridian Unit Substations, was conducted using the S-Cubed instrumentation for analysis. Four samples, N0-2, NB-3, NB-1 and M-1, revealed PCB concentrations above City Light's action levels.

SCL 04444

Pursuant to work order #87-2, the samples under question (plus an additional sample, number M-2 determined to have low levels of PCBs by the S-Cubed method) were submitted to an independent laboratory for analysis. The laboratory, ECOVA Analytical Services of Redmond, WA., determined that all samples were negative.

In this work order, Raven will compare both sets of results and validate the five samples using the HP gas chromatograph. A report, describing the discrepancies in the two methods will be submitted to City Light and incorporated into the final text of Work Order #87-2.

## II. SAMPLING METHODOLOGY AND REPORT

### A. Sampling Methodology

1. Collection, storage, processing, and analysis of samples will be according to current U. S. Environmental Protection Agency standards. PCB analysis will follow the Method 8080 (EPA document SW-846, 1982).
2. Sampling equipment will be decontaminated between each sample. Solvent rinse will be collected.
3. Appropriate protective gear will be used to ensure safety for the sampling crew.
4. After all analyses are completed, any remaining sample materials, if they constitute a hazardous material, may be returned to City Light for appropriate disposal.
5. Drawings will be provided on which the location of samples will be marked.

### B. Report

1. Description of the conditions and date(s) of sample collection.
2. Documentation of preparation of sampling equipment and containers to avoid sample contamination.
3. Description of containers, procedures, reagents, etc., used for sample collection, preservation, transport, and storage.

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May 6, 1987

4. Field sampling procedures.
5. Sample preservation methods and holding time.
6. Sample chain-of-study procedures.
7. Documentation of methods for sample processing and analysis (including any changes from the test procedures in Method 8080, in method, apparatus, reagents, calibration, or quality control, extraction separation, a gas chromatography or calculations).
8. Laboratory results expressed on a dry-weight basis and identifying PCB composition of Arochlor species, including a brief description of the sample material (e.g. concrete, soil, and gravel, etc.)
9. Documentaiton of each sampling site.
10. An interpretation of the data along with conclusions/ recommendations.

III. SCHEDULE

		<u>Due Date</u>
Sample Collection	-	Day 0
Draft Report to EAD	-	Day 21
Final Report to EAD	-	One week after review of draft by EAD

Two copies of a report in draft form will be delivered to EAD.  
Five copies of a final report will be delivered to EAD.

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